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Variation of soil moisture characteristics in a part of Hindon river catchment

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ABSTRACT

Mathematical models of hydrologic and agricultural systems require knowledge of the relationships between soil moisture content (ø), soil water pressure (h) and unsaturated hydraulic conductivity (K). Hence, a sustained research effort towards the parameterisation of K(h) and h(ø) has resulted in the development of several laboratory, field and theoretical methods.

This study aims at field and laboratory determination of soil moisture characteristics in a part of Hindon river catchment and to study their variation along the Hindon river in its upstream reach. A total of 38 soil samples were collected from 14 sites in Aurangabad, Kamalpur, Budhakhera, Gagalheri and Dudhil Bukhara comprising around 24 km reach, upstream of Hindon river. Field determination of saturated hydraulic conductivity was made at 8 locations through Guelph Permeameter. Extensive laboratory measurements were made for each soil sample collected. Soil texture was determined through sieve analysis and laser diffraction technique. Porosity was obtained for each soil sample. Saturated hydraulic conductivity was measured through ICW Permeameter in the laboratory. Retention curve was obtained through pressure plate apparatus. Unsaturated hydraulic conductivity function was indirectly derived through van Genuchten retention parameters. The report presents a thorough soil investigation results for the uppermost part of Hindon river.